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### **03P494USIDS**

#### ***Random pulse generator***

A random pulse generator comprising an amplitude discrimination circuit having two input terminals, a noise source such as an amplifying circuit, which is connected to one of the input terminals of the amplitude discrimination circuit, for generating a noise having an amplitude distribution similar to a Gaussian distribution, a voltage restricting circuit connected to the other input terminal of the amplitude discrimination circuit, a waveform shaping circuit connected to an output of the amplitude discrimination circuit, a counting rate setting circuit, an error amplifying circuit connected to an output of the counting rate setting circuit, and a counting rate meter circuit connected to an output of the waveform shaping circuit, the random pulse generator having a an average repeating rate stabilization negative feedback loop in which, after calculating a difference between an output of the counting rate meter circuit and an output of a repeating rate setting circuit, a signal voltage amplified in the error amplifying circuit is fed back to a level voltage input terminal of the amplification discrimination circuit through the voltage restricting circuit, wherein

the voltage restricting circuit includes a resistance, a first comparator, a second comparator, a first voltage source, a second voltage source, a first relay, and a second relay,

an in-phase input terminal of the first comparator and an inversion input terminal of the second comparator are configured to be an input terminal of the voltage restricting circuit, the inversion input terminal of the first comparator and the first voltage source are configured to be an output

terminal of the voltage restricting circuit through a contact of the first relay driven by an output of the first comparator, and the in-phase input terminal of the second comparator and the second voltage source are configured to be the output terminal of the voltage restricting circuit through a contact of the second relay driven by the output of the second comparator, the resistance is connected between input and output terminals of the voltage restricting circuit, and the voltage restricting circuit takes a voltage value between a first voltage value and a second voltage value, regardless of an input voltage.

Reference numerals:

- 1. counting rate setting circuit
- 5. error amplifying circuit
- 6. noise source circuit
- 7. voltage restricting circuit
- 11. counting rate meter circuit
- 12. amplitude discrimination circuit
- 15. waveform shaping circuit